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REDUCING POVERTY THROUGH TIMELY AND EFFECTIVE IMPLEMENTATION OF THE UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION

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I. INTRODUCTION

1. In recent years, the United Nations system, relevant international organizations, the donor community and various civil society organizations have taken an increasing interest in the linkages between poverty reduction and the combat against desertification.

2. In its preamble the United Nations Convention to Combat Desertification (UNCCD) states that "desertification and drought affect sustainable development through their interrelationships with important social problems such as poverty, poor health and nutrition, lack of food security, and those arising from migration, displacement of persons and demographic dynamics".

3. In addition to being the only environmental convention with a specific concern for drylands, the UNCCD is also a poverty-focused instrument that has yet to attain its full potential through improved implementation and coordination with related instruments dealing with sustainable development. Recent developments lead us to consider a joint poverty reduction and desertification control strategy that would rely on countries' ownership through a series of instruments and coordinated strategies.

4. At the fourth session of the Conference of the Parties to the UNCCD held in December 2000, the Parties adopted the Declaration on the commitments under the Convention to enhance implementation of the obligations of the UNCCD. The Declaration reaffirmed that Parties should adopt, inter alia, an integrated approach addressing the physical, biological and socio-economic aspects of the processes of desertification and drought. The Parties also recognized the need to ensure that effective action is taken on initiatives on combating poverty derived from the Convention, with a view to achieving sustainable development in affected areas.

II. THE CHALLENGES AND CONSTRAINTS OF POVERTY REDUCTION IN AFFECTED DEVELOPING COUNTRIES

5. Actions to combat desertification have in the past tended to focus on reversing the biophysical aspects leading to land degradation without taking fully into account the underlying socio-economic causes. This approach has proven to be inadequate.

6. Recent studies on the linkages between poverty reduction and land degradation confirm that there is a variety of constraints which affect people's capacity to improve their living conditions through activities leading to sustainable development in drylands. These can be categorized as environmental, technological, socio-cultural, economic and institutional constraints.

Environmental constraints

7. According to the United Nations Environment Programme (UNEP), more than 6.1 billion hectares of the total land area of the earth is drylands. In Africa it is estimated that 73 per cent of the region is moderately or seriously affected by desertification. In Asia, the phenomenon extends over 1.7 billion hectares out of a total land area of 4.3 billion hectares which are arid, semi-arid or dry sub-humid areas. In Latin America and the Caribbean, about one quarter of the land is dryland and desert.

8. The international scientific community has confirmed that accelerated trends in climate change, within the context of worsening drought and unreliable rainfall patterns, are perceived as a growing threat for the countries affected by desertification. As a consequence, many people in these countries are becoming more vulnerable, especially those living in rural communities, while the nutritional needs of an increasing world population continue to grow.

Technological constraints

9. Most affected developing countries lack access to suitable technology and methodologies, notably to monitor the impact of land degradation and obtain a clear picture of its status. Specific constraints have been identified by developing countries in various reports submitted to the Conference of the Parties as well as in the various UNCCD events held recently, particularly at the inter-sessional meeting of the Ad Hoc Working Group (AGWG), held in March-April 2001. These constraints include: inadequacy in the provision of weather forecasts (early warning systems); deficiencies in water resource and socio-economic data; poor diffusion of appropriate technology to the end-users; limited involvement of universities in research and extension education; lack of adequately trained personnel.

Socio-cultural constraints

10. Local indigenous knowledge is not fully taken into account in the policy frameworks to combat desertification. The land tenure systems in many countries still constitute a factor that limits access to land and security of tenure. The role and responsibilities of women in rural areas are not sufficiently noted in development policies and programmes.

Economic constraints

11. Many of the heavily indebted poor countries are affected by desertification. According to UNEP, the annual income lost in areas immediately affected by desertification around the world amounts to 42 billion US dollars. Of this total, Africa loses about 9 billion US dollars, Asia 21 billion US dollars, and South America 3 billion US dollars, due to the consequences of desertification.

12. Affected developing countries continue to face low market competitiveness in respect of exports of rural production as well as limited access to affordable funding and credit. As a consequence, these countries encounter difficulties in investing significant resources in activities towards combating desertification. They remain, therefore, heavily dependent on official development assistance given that the UNCCD does not benefit as yet from a predictable funding mechanism. Declining trends in ODA have thus a negative impact on progress in delivering the obligations of the UNCCD in affected developing country Parties.

Institutional constraints

13. Issues relating to desertification are often delegated to environmental ministries. In countries where there is poor cross-sectoral and intersectoral coordination in the areas of combating desertification, the national action programme process tends to remain outside the core activities of the national development strategies.

14. In addition, the lack of adequate legislative and institutional measures on specific areas such as water management, rangelands, and land use hamper successful implementation of the Convention.

III. POSSIBLE ELEMENTS FOR POLICY ORIENTATION

15. Because of the integrated approach of the Convention, there is a need to pursue better articulation of environmental and socio-economic policies. In many affected developing countries, steps have been taken to formulate comprehensive sustainable development strategies containing priority areas identified in the national action programmes to combat desertification.

16. At the Ad Hoc Working Group, many affected developing countries reported successful experiences, especially at the level of community-based organizations. Progress was made in relevant areas, such as the rational management of scarce water resources, land reclamation, rangeland management and soil conservation.

17. With regard to financing the implementation of the Convention, many of the AHWG participants noted that the mobilization of financial resources remains a key challenge. A strategy for reducing poverty and combating desertification must rely on a predictable funding mechanism which not only provides new and additional sources of financing, but also builds a coordinated programmatic approach among the multilateral funding institutions. This programmatic approach must acknowledge the primary importance of the UNCCD as a poverty alleviation tool, in addition to its global environmental significance.

18. Several Parties observed at the last AHWG meeting that alternative ways of supporting activities to combat desertification should be sought, such as the creation of market opportunities for the private sector. The private sector has an important role to play especially in sustainable agro-economic activities that contribute to income generation in drylands areas.

19. The potential for private sector investment in the drylands is recognized in sectors such as the production of medicinal plants and genetic material for the pharmaceutical industry, in ecotourism. Nevertheless, incentives must be provided to encourage the sustainable use of land resources by corporate interests.

20. Parties also observed at the last AHWG meeting that the allocation of provisions to rural development and/or combat against desertification within the national budget of an affected country Party is an important indication of the political will of that country to meet its obligations under the Convention.

21. Parties further recognized the need to intensify the consultative process between developed and developing countries with the aim of replacing the traditional donor-recipient approach by genuine partnership approach. In this respect, the role of bilateral partners must be more clearly defined in elaborating a country-driven mechanism for concluding partnership arrangements. The usefulness of the role of the *chef de file* for instance should be further assessed through a well established working relationship and policy dialogue.

22. With regard to the challenge posed by the intricate relationships of climate, biological diversity and desertification, a clear convergence of objectives among the three Rio Conventions has been demonstrated. Consequently, the need for a common strategic approach, particularly at country level, must be addressed. The

principal goal remains the generation of a country-driven process by which policy makers and other relevant actors will work towards achieving synergy between various activities at the field level.

23. Some efforts are already under way to foster integrating approaches between the Rio Conventions (UNCCD, UNFCCC and CBD). In this regard, the development of a joint work programme between the CBD and the UNFCCD can assist affected developing countries in their effort to link up complementary activities in dryland areas.

Priority measures

24. The Declaration on the commitments under the Convention recommended that the efforts of the affected countries should concentrate on specific key areas, which include, inter alia, sustainable land use, integrated management of water resources, development of new energy sources, development of sustainable agriculture and management of rangelands.

25. In the light of the above and recommendations made by countries at recent UNCCD events organized at various levels, the priority measures to be undertaken may include the following:

A. Sustainable land use (agroforestry and soil conservation)

26. Sustainable land use is of primary interest to rural communities, and some countries have already taken it on as a priority activity to be developed at local level. This implies developing a methodology, in line with the Convention, which takes into account localized and integrated community approaches in order to enhance the initiative of the farmers. Priority activities could include: decentralization in respect of strengthening rural community systems, enacting policies that would guarantee land security for the users, promotion of capacity-building activities and concessional investment flows in order to strengthen community-based organizations and improve local incomes, and facilitation of the adaptation of technology and practices. The sequestration of carbon may constitute an entry point for this activity.

B. Integrated management of water resources

27. Sustainable use of water resources is crucial in the arid and semi-arid areas, in order to prevent and/or halt land degradation. The population dynamic and limited livelihood options can lead to over-dependency on land and to over-exploitation of the limited supply of water. Activities to be undertaken should include a set of measures such as:

- Assessment of the availability of water resources, and strengthening of a water resources information system;
- Capacity-building/utilization, institutional strengthening, and technical and scientific cooperation;
- Institutional, legislative, regulatory and economic reforms, as necessary;
- Cooperation on integrated water resources management in international river, lake and hydrogeological basins;

- Sustainable water supply and sanitation infrastructures in the drylands.

C. Development of new and renewable energy sources

28. There exists a close linkage between energy and land degradation in dryland areas. The identification and utilization of alternative renewable energy sources, instead of using firewood, has the potential to provide for better livelihoods and should be explored.

29. The dryland regions have considerable solar energy potential and, in some areas, windy conditions that are conducive to the harnessing of wind energy and the exploitation of biomass for energy purposes. In the light of these potentials, five important types of new and renewable energy sources can be developed:

- Solar photovoltaic: converting sunlight into electricity. This has various applications such as lighting, refrigeration, water pumping;

- Thermal solar power: using the sun's rays to produce energy, for domestic activities (fuelling, cooking and generating electricity);

- Wind power: using the wind's strength to fuel water pumps and to generate electricity;

- Bio-mass: using wood, plant and animal waste for energy purposes. There are also multiple technologies for valorizing biomass: traditional stoves, improved stoves, biogas;

- Micro-hydraulics: generating energy through putting stored water through turbines in micro-dams.

D. Development of sustainable agriculture

30. Agricultural development strategies tend to be directed towards enhancing productivity, emphasizing short-term profitability at the expense of long-term development. In the case of developing countries affected by desertification, priority should be given to a programme approach, which may include the following elements:

- Promoting closer interaction between research and development. Agricultural development and research will mutually benefit from closer interaction. Participatory methods involving farmers, farmer associations, extension agents, development programme technicians, NGO members, policy makers, traders and scientists should be adopted in setting the priorities for development and research;

- Promoting adaptable and appropriate technologies to support sustainable agricultural farming systems;

- Making use of early warning systems to support food production and marketing systems;

- Promoting relevant incentive measures, including access to affordable funding and credit. These measures would improve the access of producers to agricultural inputs;

- Promoting the interests of the countries concerned through enhancing the market access of their exports.

E. Rational use of rangeland

31. Rational use of rangeland in affected developing countries involves as much effort from the central authorities and cooperating partners as it does from rural societies. The activities to be undertaken should therefore take into account some guiding needs according to the context. Hence the following were recommended at UNCCD events:

- Promoting research and development for the sustainable use of rangelands, including fodder production, animal husbandry and land dune fixation;

- Extending ecological monitoring programmes to the drylands areas;

- Establishing or strengthening extension services, and adult education in pastoral areas;

- Establishing or strengthening forums for advocacy dialogue and the promotion of alternative livelihoods, and make traditional knowledge from pastoral communities more widely available;

- Defining not only the legislative frameworks and procedures which would allow the local people affected to participate in the drafting of an appropriate law, but also ensure the coherence, effectiveness and equity of the proposals made by those people;

- Reviewing the institutional framework to ensure a level of decentralization in the application of the programme governing the activities of farmers and pastoralists;

- Developing participatory approaches to rangeland management in order to enhance the recovery of vegetative cover, thus improving options for social and economic development for local communities in affected areas;

- Undertaking research in order to improve the nutritional value of animal feed and fodder productivity, using indigenous and exotic species;

- Facilitating livestock movement to markets; reducing barriers in favour of livestock trade.

IV. CONCLUSIONS

32. The assessment of recent political trends and policies relating to the critical poverty-environment nexus reveals an increasing political interest in the interrelationships between land degradation and poverty reduction. The major

cooperating partners consider the fight against poverty to be an overriding goal of international development cooperation and recognize the close linkages between poverty and desertification.

33. Further, it is recognized that reducing poverty and combating desertification requires an integrated approach which takes into account various environmental, technological, socio-cultural, economic and institutional constraints faced by the affected developing countries. While important steps are being taken in this direction through the formulation of national sustainable development strategies, as well as through the strengthening of synergies and cooperation between different instruments dealing with sustainable development, the key challenge of mobilizing sufficient financial resources through a genuine partnership approach remains yet to be met.

34. With regard to its mandate, its approach and its working methods, the UNCCD constitutes a strategic instrument for addressing poverty reduction in dryland ecosystems. The UNCCD holds an important mediating position between development objectives and environmental concerns within the international community, and links the global dimensions of both issues. To meet the objectives of the Convention, the role of the action programmes to combat desertification in developing countries needs to be further emphasized by securing the political and financial means for ensuring the effective implementation of the priority measures contained in these programmes.

35. The high-level segment of the fifth session of the Conference of the Parties to the Convention may wish to make recommendations on ways of further strengthening bilateral and multilateral cooperation with a view to enhancing the implementation of the Convention and fostering sustainable development in affected country Parties.

36. The World Summit on Sustainable Development to be held in 2002 will also provide an excellent opportunity for further integration of poverty-focused initiatives to combat desertification. In this regard, the high-level segment of the Conference of the Parties may wish to proclaim the UNCCD as the prime tool to address the poverty eradication in rural areas of drylands, and to convey this message to the WSSD in Johannesburg.

Issue-areas for further reflexion

How can the UNCCD promote joint implementation of environmental and poverty-related instruments at the national and regional levels?

How could the UNCCD promote improved coordination of its implementation with other conventions at the national level?

What should the UNCCD priorities be in terms of capacity-building? What should the priorities be in the fields of technology transfer, scientific research, institutional development, and information exchange?

How could developed parties improve their support to the implementation process?

How can the UNCCD improve its collaboration with private sector organizations?

Which innovative financing strategies could be developed? How can foundations and private sector organizations best contribute to financing the UNCCD?

Which strategic directions should development organizations and financial institutions adopt to strengthen their support to implementation of the UNCCD?

How can resources devoted to poverty alleviation contribute to implementation of the UNCCD?

Annex I

SUBMISSIONS FROM CANADA

A. The Global Drylands Partnership

What is the Global Drylands Partnership?

The Global Drylands Partnership (GDP) is a recent collaboration of organizations involved in drylands development. This partnership includes: The Canadian International Development Agency, The United Nations Development Programme's Office to Combat Desertification and Drought (UNSO), UNDP/Global Environmental Facility, the International Institute for Environment and Development, the World Wildlife Fund, The World Conservation Union and the Near East Foundation. It is a growing partnership that is dedicated to addressing drylands issues and increasing the awareness of their importance, particularly in the context of UNCCD implementation.

Challenge Papers

The GDP has recently developed a series of Challenge Papers on four thematic areas:

1. Poverty and the Drylands
2. Strategies for the Sustainable Development of Dryland Areas
3. Biodiversity in the Drylands
4. Vulnerability and Adaptation to Climate Change in the Drylands

These topics were chosen to emphasize the recent urgency in addressing poverty and climate change issues within the international development agenda, as well as the need to build on the synergies between the major global conventions. As organizations dedicated to drylands development it is necessary that we explain where drylands issues lie in these emerging themes.

The purpose of these papers is to challenge existing myths and current presumptions of dryland areas, thereby changing the conventional perceptions of the drylands and providing a reliable source of information for decision-makers to refer to.

Most of the literature on drylands development is pessimistic, yet there is overwhelming evidence that drylands can be productive and are great sources of biodiversity. The United Nations Convention to Combat Desertification and Drought (UNCCD) was formulated to increase attention and support to the drylands of the world. Unfortunately, since its adoption, its implementation has been generally poor. These challenge papers are intended to cast a new insight into how we view and work in the drylands. They are meant to question many of the underlying assumptions (some of which are incorrect) that frequently inform programme designs and interventions in the drylands. By highlighting these critical challenges in discussions and CCD implementation, we hope to contribute to revitalizing national efforts in addressing drylands development.

The Challenge Papers are a work in progress and will be updated as they are revised. The summary articles for the papers were prepared by UNSO with editorial assistance from Eugene Linden. The articles were written, utilizing the information from the papers, therefore the sources for the information within the articles can be found in the papers.

Acknowledgements

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All of the articles and papers listed below can be downloaded in MS Word. Other papers and articles will be posted as they are developed.

Summary Articles

1. Poverty and the Drylands
2. Strategies for the Sustainable Development of Dryland Areas
3. Biodiversity in the Drylands
4. Vulnerability and Adaptation to Climate Change in the Drylands

Challenge Papers

1. Poverty and the Drylands
2. Strategies for the Sustainable Development of Dryland Areas
3. Biodiversity in the Drylands
4. Vulnerability and Adaptation to Climate Change in the Drylands

B. Poverty in the drylands

Think of the war on poverty in developing nations as an analogue of World War I. In this fanciful construct, big irrigation projects in areas of high agricultural potential would be the equivalent of trench warfare in France, the battles that consumed vast resources (and accounted for huge losses). In the minds of the high command, however, the fight to alleviate poverty in the drylands would be more like a minor skirmish in a faraway continent -- a sideshow of only peripheral interest. For a variety of reasons, the issue of poverty in the drylands has been treated as a marginal phenomenon, isolated from the main thrust of development.

This is a tragic misunderstanding based upon a number of assumptions about the paucity of dryland rural populations and their remoteness from the pressing concerns of emerging nations. These assumptions fall apart upon close scrutiny. In fact the tendency to isolate dryland concerns undercuts anti-poverty initiatives. A major challenge facing the development community will be to put drylands development where it belongs: at the heart of development and poverty alleviation for nations that contain significant amounts of arid and semi-arid lands.

In poor countries, the very poorest of the poor tend to be rural dryland peoples. When things go bad in the hinterland, problems quickly transmit to the more humid areas. Cities lose the benefit of dryland production, while they gain a surge of migrants, often without the skills and education to successfully integrate into urban life. And if drylands contribute in unexpected ways to national poverty problems, they also hold the promise to be part of the solution. Well documented case studies such as the Machakos in Kenya have shown that dryland peoples such as the Akamba can bootstrap their incomes, husband soils, and reduce migratory pressures on cities with just a modicum of outside help.

Drylands cover 40% of earth's terrestrial surface and house two billion people, but the figure is misleading as it includes urban and suburban populations in rich and poor countries as well as affluent dryland residents in Europe, Australia, and, notably, the U.S. (half of whose territory falls into the category). The population that contributes disproportionately to poverty figures comes from the approximately 800 million to one billion rural people who live in the hotter dryland areas. In largely rural nations such as Mali and Eritrea, the issue of integrating dryland issues is moot since virtually all agriculture takes place against a backdrop of water scarcity.

In countries with both humid and dry regions, poverty tends to increase as moisture decreases. Cameroon's northern drier region contains 31% of the nation's population, but 50% of its poor. In the driest regions of Kenya as much as 84% of the population is impoverished. While the average life expectancy for residents of Nairobi is 66 years, the figure for Wajir in the northeast is 53. While the distance from Nairobi to Wajir is not that great, in terms of the Human Development Index, it is the difference between Thailand and Tanzania.

While there are moral arguments to reducing these discrepancies in Kenya and elsewhere, there are powerful self-interested economic arguments as well. Nations pay the costs for rural poverty and environmental degradation one way or another. The incidence of stunted children in West Africa correlates highly to environmental degradation. Allowed to continue unchecked, the vicious circle of rural poverty and environmental decline will transfer both people and unwelcome costs to the more affluent areas.

In Mexico, for instance, the migratory pull factor of better wages is increasingly supplemented by the push of desertification linked to unbearable pressures on the land, particularly in states like Oaxaca whose rural districts have among the highest birth rates in Mexico.1/ Population pressures force families to reduce fallow periods and overgraze existing lands and push into steep erodable areas and forestlands, further eroding already stressed soils. Salinization and desertification lead to a dramatic decline in agricultural productivity, and in some cases the outright abandonment of land that in some cases had been farmed for thousands of years.

At this tipping point, migration offers the only alternative to economic ruin according to Leighton. Most of Mexico's cities already strain to deliver water, electricity and other basic services. Without the "safety valve" of migration to the United States, the threat of political instability would increase dramatically.

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[1] Leighton, M. (1999). *Environmental degradation and Poverty in Drylands, Development and Poverty Proceedings of the June 15 & 16, 1999 World Bank Round Table.* World Bank, Washington D.C.

Even without migration, rural poverty can impose large, unexpected costs. So China discovered in 1998 when deforestation in upland areas amplified El Nino related floods into monster inundations that killed 3,600, left millions homeless and inflicted billions of dollars in damage on the economy in Southern China. Given these huge hidden costs of dryland poverty, investments in appropriate agriculture and family planning seem nothing less that common sensical.

Any drylands strategy, however, should be sensitive to the interconnections between dry and humid regions in emerging nations. In Nigeria, for instance, 42.6 million people live in the drier part of the country, and contribute significantly to agriculture, which accounted for 39% of GDP in 1998. Grazing livestock during the short rainy season, dryland pastoralists move south following the rains retreat, avoiding the Tsetse fly and moving the animals closer to markets in the wetter areas. On their return, herders carry with them maize, yams and other root crops grown in the south. In this ancient rhythm dryland peoples contribute both as producers and consumers. Modernity has had its impacts on this traditional pattern, but it illustrates one way in which dryland and other economies intermingle in emerging nations. Programmes blind to these integuments risk disrupting the complex ties that bind dry and wet regions.

Investment in the drylands still must be justified against the many competing claims for scarce development dollars. Drylands might well be the loser in a fair triage if drylands peoples were content to be passive victims of events. The evidence, however, suggests that this is not the case and sometimes small changes can produce dramatic results. Drylands populations are excellent at coping, display great innovative abilities given the opportunity, and are extremely responsive to economic signals and opportunities.

In the Sahel, farmers and herders quickly responded to the devaluation of the CFA franc by raising livestock and cereal exports to take advantage of a more favorable competitive position. In the Machakos in Kenya, the people themselves dealt with water management, soil erosion and crop fertility problems once they had secure property rights, the ability to implement their own decisions and access to markets. Mostly on their own initiative, the Akamba have devised ways to capture every drop of rain, including road run-off. Since the 1930s the regions population has increased by a factor of six, but these innovations have increased output tenfold (although at the cost of crowding out many rare indigenous species). Mali's drylands peoples, widely regarded as a lost cause in the 1980s, are still there and agricultural production has improved dramatically even as the number of aid workers has diminished.

As societal values change, new opportunities arise in the drylands. As the example of wildlife tourism has shown in Kenya, Botswana, Tanzania, Namibia and elsewhere, the drylands have value far beyond their agricultural and mineral production. Unfortunately, as in the case of mining, this wealth rarely trickles down to the local residents. The tableau of urbanites getting rich off the drylands while the local residents struggle with poverty and overtax their environment, mutely and eloquently illustrates the folly of segregating dryland issues from national planning.

At the policy level, an essential first step will be to dovetail now separate

strategies for poverty reduction with dryland programs such as National Action Programmes to Combat Desertification and Drought. Governments should also seek ways to unlock the innovative abilities and energies of dryland peoples. By shifting development focus from welfare to productivity and sustainable growth, and by eliminating trade rules and market problems that discourage local initiative and investment, a good number of now impoverished drylands might become a boon to urban areas and national economies rather than exporters of poverty and social problems.

C. Challenge paper: Poverty in drylands

POVERTY AND THE DRYLANDS

Philip Dobie (UNDP)
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Introduction

Since the negotiation of the United Nations Convention to Combat Desertification and Drought (CCD) there have been numerous attempts to estimate the number of people living in the world's drylands, and obtain an idea of the scale of the problems at stake and argue for greater attention to their needs. Unfortunately the figures that are quoted are usually consolidated from many different sources. Thus, it is very difficult to deduce exactly who the poor are, where they live and what they do.

Global statistics need careful handling. Skepticism may be raised when very high figures are quoted with no attempt made to disagregate them. Equally, by quoting large numbers of people at risk and associating these figures with images of starving people living in hostile arid places, many observers simply conclude that there is little hope for the world's drylands. Instead, they would opt to invest in higher potential areas leaving drylands problems to be dealt with by welfare and crisis management programmes. A third problem is that focusing on drylands peoples ignores the dynamics of movement and trade taking place between the drylands and other areas. The economic opportunities for drylands will not be understood simply by counting the people who are there at any time, but by understanding the ways that other areas rely on the produce and labour provided by the drylands, and how the drylands in turn import goods and services from outside.

This paper takes as its initial premise the assumption that there are important and significant populations in the world's drylands who, given the right conditions and incentives, can achieve good livelihoods, accumulate assets to reduce vulnerability and escape from poverty. However, to make a convincing case it is necessary to challenge current wisdom on the distribution and condition of drylands populations, and build more realistic scenarios that decision makers can take seriously. This is a major task, and this paper will only set the challenge and introduce some of the new evidence that is required.

Commonly quoted statistics

Two recent publications provide the most comprehensive up-to-date statistics on drylands populations available[1]. They tabulate the extent of arid regions in Africa, South Asia and Latin America, and their respective human populations. Based on the definitions agreed within the CCD, it is shown that about 40% of the earth's surface is made up of drylands. The percentage of the world's population living in these drylands was calculated to be about 38%, equivalent to 2.3 billion of today's global population of 6 billion.

These are startling figures for the number of people living in the arid, semi-arid and dry sub-humid parts of the world, and should be better known to policy makers. Indeed, one of the original purposes of the research that led to these figures being published was to draw attention to the very significant numbers of people living in and deriving their livelihoods from the drylands. Closer analysis is needed, however, to understand their full importance.

Challenging the figures

The first challenge in interpreting these data is to get a better understanding of drylands livelihoods. It would be a mistake to assume that all 2.3 billion are poor, rural dwellers. Indeed, the arid, semi arid and dry sub-humid parts of the world contain many of the world's great cities. New Delhi (1993 population 8.96 million[2]) and Mexico City (1990 population 9.8 million[3]) are just two examples of mega cities that happen to be in the drylands. In 1995, the level of urbanization in the world was as follows: Africa 34%, Europe 74%, North and Central America 66%, South America 78%, Asia 35%, and Oceania 70%.[4] By applying these proportions to the number of people living in the drylands, it can be estimated that 800 - 900 million of the world's drylands population live in cities. While this is a very crude estimate, it does serve to emphasize that development can only be tackled through a clear understanding of the regional dynamics in drylands areas containing both urban and rural populations. Therefore, the number of rural dwellers directly suffering from desertification and land degradation are considerably fewer than the figure of 2.3 billion. However, even more importantly, the figures point to the overall economic vitality of the drylands, with modern cities as well as more traditional agriculturalists.

A second adjustment that needs to be made to global figures is to separate them into developed and developing regions. Again, the data to do so are not readily available. Half of the surface area of the United States of America is classified as drylands. However, most people would argue in favour of excluding the

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[1] *Aridity zones and drylands populations*, United Nations development Programme Office to Combat Desertification and Drought and World Resources Institute (1997). *Drylands population assessment II (draft)* United Nations development Programme Office to Combat Desertification and Drought and World Resources Institute www.undp.org/seed/unso (1999).

[2] *World Resources 1996 - 1997*, Oxford University Press, published World Resources Institute, ISBN 0-19-521160-X.

[3] www.xist.org

[4] *World Resources 1996 - 1997*, Oxford University Press, published World Resources Institute, ISBN 0-19-521160-X.

US populating (276 million) and that of Australia (19 million) from the estimate of those at risk of impoverishment from desertification[5].

There are clearly many types of drylands country, facing very different challenges and requiring very different policy responses, as shown below.

	Land area (thousands Km²)	Population on productive lands (million)	Population on drylands	Drylands population as % of pop. on productive lands
India	3,275	919	410	45
Nigeria	913	111.7	42.6	38
Botswana	580	1.4	1.4	100
Mali	1,254	10.7	10.3	96
Eritrea	121	3.1	3.1	100

India and Nigeria are examples of large, populous countries that have significant dryland areas and the total numbers of people living in these areas are 410 million and 42.6 million respectively (although many will be urban dwellers and not reliant on livelihoods directly from the land)[6]. However, the proportion of people living in the drylands in each country is less than half their total population. Countries of this size have the advantage of considerable diversity within the country, so far as the climate is concerned. There are many other opportunities for alternative livelihoods, and substantial trade in goods and services. India has a highly diversified economy, with a strong industrial sector (26.3% GDP in 1999, including 15.9% manufacturing). (All economic data are *World Bank*[7]). However, agriculture continues to be a prominent sector (27.7% of GDP). Much of this is dryland agriculture, comprising about 50% of India's agricultural land. The country has made extensive use of irrigation and other forms of water management, and can trade commodities and services between the drylands and other regions.

The ability to benefit from different ecosystems within a single country is also very clear in the case of Nigeria, where agriculture is the dominant sector (39% of GDP in 1998, a figure that has increased over the last twenty years). Nigeria stretches from the humid south coast to the semi-arid lands of the North. Rains that are plentiful in the South extend northwards seasonally, touching the northern regions for only a short period. Thus rainfall is lower and the rainy season shorter the further north one travels. Over centuries, the north has been used for rearing of livestock and growing millet and sorghum - well adapted to low rainfall. Nomadic pastoralists drive animals through the arid and semi arid zones, which can be productive, with good management. The animals are driven south during the dry season, when tsetse fly is absent, to be sold in urban markets in the humid coastal region. In turn, produce from the humid lands (maize, yams and other root crops etc.) is carried north. Obviously, this traditional pattern has become less dominant as a way of life over recent decades, but Nigeria nevertheless provides a good example of how drylands can be used to their best comparative advantage

[5] www.unfpa.org/swp/1999/Swp search_C.cfm

[6] www.unfpa.org/swp/1999/Swp search_C.cfm.

[7] www.worldbank.org/data/countrydata/countrydata.html.

within a national economy. Clearly, simply counting the people in the dry areas reveals little of this complex trading economy.

Mali, by contrast, is a huge West African country, which is almost all dryland and hyper arid desert. Only the valleys of the Niger river system provide opportunities for water management and irrigation. As a result, 96% of Mali's population lives in the drylands, and the economy of the country reflects this. Mali is a predominantly agricultural country, this accounting for 46.5% of the economy in 1999. Apart from intensive rice production schemes on the Niger, most rural Malians are engaged in pastoralism or the production of dryland crops, especially millet and sorghum. Since colonial times, Mali has been growing cotton. More recently, such production has expanded greatly. In 1999 exports of cotton were worth $244 million, more than 40% of Mali's total exports, and exceeding even gold, Mali's former export leader. Within an international trading context, Mali has been able to make use of the comparative advantage conferred by its drylands. Unlike Nigeria, Mali's north-south trade routes must cross national boundaries and hence makes trading opportunities dependent on trade policies in the broader region - a topic that will be returned to later in this paper. Equally, many Malian farming families depend on migrants' remittances from travel to Côte d'Ivoire and elsewhere. Were such opportunities to be shut down, there would be great impoverishment.

Botswana is an example of a dryland country whose economy has shifted completely from agricultural production, which contributed only 3.6% of GDP in 1999. Industry, especially the mining of diamonds, copper and nickel, dominates the economy. However, Botswana still has many poor people employed in pastoralism and small-scale crop production. The challenge for countries like Botswana is to establish the means by which dryland farmers can trade profitably within a rapidly modernizing economy. The opportunities established under agreements to export beef to the European Union under concessionary terms exemplifies the shifts that are taking place in traditional dryland economies. While minerals, beef and other exports make major contributions to the national economies of some drylands countries, they do not necessarily bring incomes to poor rural dwellers, who may be unable to assert claims on the resources in question. Indeed, exploitation of resources may even lead to the shifting of people from their land.

The poverty dimension

It is clear from the above discussion that while global figures provide insight into the need for support to drylands development, they can only be the first step in understanding how to address poverty reduction. There are strong grounds to believe that the drylands are home to great numbers of very poor people. Four years ago, Nelson et al[8] estimated that of the world's poor, about 325 million lived on favoured lands, while 630 million lived on marginal agricultural lands, forested areas and drylands. The effects of increasing populations on marginal lands which leads to increased impoverishment have been commented on by many authors. *The most important contributing factor towards degradation of fragile lands in Sub-Saharan Africa is a nexus of poverty, rapid population growth and*

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[8] Nelson, M., R. Dudal, H. Gregerson, N. Johda, D. Nyamai, J.P. Groenewold, F. Torres, A. Kassam. (1997) *Report on the studies of the CGIAR research priorities for marginal lands*. Consultative Group for International Agricultural Research, TAC working document, Technical Advisory Committee Working Group, Food and Agriculture Organization, Rome.

inadequate progress in increasing crop yields. Poor people in their quest for food and other livelihood needs are increasingly expanding cultivation into forests, steep hillsides and other fragile areas … reducing fallow periods to the point where soils are inadequately rejuvenated, pursuing land management practices that deplete soil nutrients … overgrazing pasture … cutting trees for fuelwood …". When studying the location of poor people in different parts of the world, there is a clear correlation between those living in degraded areas and high levels of impoverishment.

Take Cameroon for example, which is characterized by a fairly moist southern region and progressively dryer conditions further north, with the Northern Region being extensively dryland. In 1987 31% of all Cameroonians lived in the Northern Region, and 50% of the country's poor population lived there. Poverty increases from the coastal region northwards. It is below 25% in the urban centres of the south west yet 50% in the dry rural north. Illiteracy and housing conditions are worst in the north, while the highest rate of maternal mortality was recorded in Maroua in the far north. School enrollment rates are lowest in the northern provinces and the enrollment gap between boys and girls widest there[10]. A similar patter can be discerned in Kenya[11]. *The highest incidence of poverty (68 - 84% in 1994) is found to be in the Arid and Semi-Arid Lands (ASAL) districts in Northern Kenya.* There is also a great disparity between the most favoured regions and the dry north. Life expectancy in Nairobi is about 66 years, but 53 in Wajir (in the arid lands of North-East Kenya). Adult literacy in Nairobi is around 93% while it is 12% in Wajir. Secondary school enrollment in Nairobi is 55%, and 5% in Wajir. The Human Development Index in Nairobi is 0.72 and 0.26 in Wajir, a level of disparity similar to the difference in HDI between Thailand and Tanzania.

Data from Kenya 1989 census	
Number of arid and semi arid districts	19
Range of proportion of national population of drylands districts	0.3 - 6.5%
Total people in arid and semi-arid lands	8.6 million
Arid and semi-arid population as proportion of national population	40.1%

(The analysis is based on current district boundaries. There have been considerable changes since 1989, and as a result the analysis misses about one quarter of the population who live in new districts. However, the distribution of new districts will tend to make the figures for total arid and semi-arid populations conservative estimates. New census data will be available soon, and it will be interesting to compare today's data with those presented above, especially in terms of population movement in and out of the dry districts).

Given the competing demands for investment in all parts of Kenya, does it make sense to invest in these dry, fragile areas? Recent research of the Machakos, shows the enormous improvements in productivity, incomes and sustainability that can be achieved when the conditions are right. This semi-arid part of Kenya, once plagued by drought, severe soil erosion and endemic poverty, is now referred to as the "Machakos Miracle". Governance changes have been at the centre of changes that

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[9] Babu and Hazell.

[10] Cameroon National Human Development Report 1998, Pub. United Nations development Programme.

[11] Kenya Human Development Report 1999. Pub. United Nations Development Programme.

have led farmers to invest their own energies and funds in soil and water conservation, leading to vastly improved fertility and highly profitable agriculture[14]. Much of the story of the transformation of Machakos - including where the transformation has still to touch all poor people - is summarized in *World Resources, 2000 - 2001*[15]. The lesson from Machakos is that farmers with secure rights to their land, a system of governance that permits them to make decisions and access to good marketing opportunities can make even semi-arid lands green and productive.

There are many opportunities for investment in the drylands. Farmers for centuries have been investing their time and limited capital in responding to new options. In many places, cash crop production can be intensified, by focusing on high-value crops, such as fruit and vegetables. Livestock keepers have always kept a close eye on changing prices in near and distant markets and adapted accordingly. Tourism can flourish in the wildlife reserves of Africa, almost all of which fall in dryland areas. Governments need to see how their own investment can add value to the effort provided by local people.

The alternative to investing in the drylands is bleak. Drylands populations are robust, but very vulnerable to drought and other shocks. If the conditions for development in those regions are not improved, even more drylands people will be driven into extreme poverty, and join those who have already left and are adding to the pressures on the cities of both the developing and developed world. Seasonal migration from drylands areas has always been a normal feature of their economies, with export of labour being a fundamental means of improving livelihoods. But, in recent decades the phenomenon has grown with more people migrating permanently, and more escaping civil conflict and serious drought. As more working age men spend more time away from their homes seeking work, it can be expected that there will be a weakening of the capacities of remaining communities to be productive, and an increase in the numbers of female-headed households.

The difficulties and threats of migration must be set against the opportunities that are created. The modern world is very much a creation of migration of people seeking better opportunities. Millions of people migrated from poverty in Europe to seek new opportunities in the Americas, Australia and elsewhere. It is unrealistic to believe that a similar phenomenon will not take place in the drylands. A major difference, however, is that increasingly labor markets are becoming saturated or closed, and there is a risk of people exchanging one form of poverty and isolation for another. They will also contribute to the pressures on cities and developed countries where they end up. Much more information is needed on land degradation as a driver of migration, and whether migration results more from people seeking a better income. Two studies can be cited. In describing a four-year investigation of migration from Mexico to the United States, Michael Leighton reported that *Although the United States will no doubt continue to attract a large number of migrants from Mexico for a number of economic reasons It is becoming increasingly apparent that the degradation of agricultural lands as a result of preventable, human-induced factors is a major*

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[14] Tiffen, M., M. Mortimore and F. Gichuki, (1994) *More people, less soil erosion, environmental recovery in Kenya*. Pub. John Wiley and Sons. Tiffen, M. and M. Mortimer (1992) Environment, population growth and produc ivity. A case study of Machakos District. Development Policy Review, **10**:358-387.

[15] *World Resources 2000 - 2001 People and ecosystems, the fraying web of life*. Pub. World Resources Institute.

determinant of the migration phenomenon[14]. Following other studies, the United States National Intelligence Council considered that migration from Sahelian countries played a significant role in the recent political destabilization of Côte d'Ivoire[15].

Despite the additional pressures placed on the drylands by increased population, there are signs that previous development assistance has worked. The author of this paper remembers that during the 1980s, aid workers in Mali were seriously discussing the long-term viability of supporting its drylands peoples, and whether it would be better to move them into more productive areas. Today, Mali's dependence on food imports has been dramatically reduced, its institutions are greatly improved, its agricultural exports have increased, it is moving into the information age by planning to link communities through the internet, and most of those aid workers are long gone.

Drylands countries and trade

The final part of the jigsaw that helps to describe the poverty-environment nexus in the drylands is trade. Drylands populations are not passive victims of their environment, but have excellent coping capacities, are innovative, and extremely responsive to economic signals and opportunities. *Prices and markets play a major role in fashioning the strategies pursued by different* [drylands-dwelling] *people in the face of changing economic opportunities. The responses of Sahelian farmers and herders to better market conditions generated by devaluation of the CFA franc bear witness to this creativity, as shown by increased livestock exports, and rising cereal prices*[16]. It is unfortunate that while there have been many examples of worthwhile projects to make technical improvements to agriculture in the drylands, there are few examples of the drylands being systematically incorporated into economic and trade policies, either nationally or regionally. An excellent discussion of the significance of trade in drylands economies is given in Snrech (1995)[17]. This shows that urban growth can be a good thing. The growth in West African cities generates demand for a range of rural produce on their hinterland areas, thereby spurring a process of agricultural investment and intensification.

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[14] Leighton, M. (1999). *Environmental degradation and poverty* in *Drylands, development and poverty, proceedings of the June 15 and 16, 1999 World Bank Round Table*. Pub. World Bank.

[15] National Intelligence Council Press release.

[16] Toulmin, C. (1999). *Environmental degradation and poverty* in *Drylands, development and poverty, proceedings of the Ju.e 15 and 16, 1999 World Bank Round Table*. Pub. World Bank.

[17] Snrech, S. (1995). *Preparing for the future: a vision of west Africa in the year 2020*. Pub. Organization for Economic Cooperation, African Development Bank and the Permanent Inter-State Committee for Drought Control in the Sahel.

We need to integrate not only the *needs* but also the *productive potential* of dryland peoples into economic and trade strategies. Taking the Sahel as an example, this region has much to offer trading partners within West Africa and the rest of the world. Instead of focusing on 1 or 2 billion mouths to feed in the drylands, we should remember this implies 1 or 2 billion pairs of hands to work. Unfortunately, where countries have valuable trading assets in their drylands, the poor seldom benefit from them. This applies equally to minerals, cash crops and the extensive wildlife in Africa that brings in valuable tourist revenues. Poverty alleviation is above all an issue of ensuring opportunities, and drylands strategies must ensure the equitable access of drylands populations to opportunities.

The development business is increasingly shifting to "integrated", "comprehensive", "programmatic" forms of development assistance. We need to put drylands development policy where it belongs - right at the heart of macro-economic, social, political and environmental policy. **First we must show how National Action Plans to Combat Desertification and Drought can be dovetailed with other strategy processes, such as Poverty Reduction Strategies. We also need to see a clear demonstration by donors that they will support the CCD and drylands development, not with an attitude of reluctant welfarism, but with an avowed intention to raise productivity and bring the drylands into the modern economy. Lets see how trade rules might positively favour dryland economies.**

Round-up

- Drylands cover more that 40% of the earth's surface.
- There are in excess of 2 billion people living in the drylands.
- But, not all of these people are either primarily dependent upon the land, nor are all of them rural dwellers. The absolute number of poor rural drylands people may nearer to one billion.
- However, this "numbers game" distracts from the real issues. The absolute numbers of people in the drylands are great, and poverty is particularly associated with dry areas.
- But, the condition of poverty in the drylands is not absolute, and there are many examples that demonstrate the potential of people in the drylands to pursue good livelihoods. The secrets are not in welfare and crisis management, but in establishing the right systems of governance and markets that will provide incentives for people to invest and work.
- Markets and trade are of great importance to drylands farmers and herders. The most important helping action for any of them will be for policy makers to understand the productive capacities of those peoples, and the benefits to be derived through full integration of the drylands into national and regional economic policy.
- The development cooperation community now has a great opportunity to put drylands development where it belongs - at the heart of development policy, especially through integration into poverty alleviation strategies.

- While much progress has been made in the development of drylands, the needs continue to increase. In a modern world where goods, services and labour are increasingly traded in a global market, the tendency for large numbers of people to abandon the drylands will increase. This will not be an altogether bad process if educated, capable people choose to seek their future elsewhere. But if societies are left to collapse, there will be a steady attrition of population, placing huge burdens on the places they go to, and leaving increasing numbers of people - predominantly the elderly, women and children - who will require continued and expensive help both from donors and their own nations coffers. However, migration is a continuing phenomenon that has shaped today's world. Migration to escape poverty has created today's economic powerhouses. The purpose of development must not be to keep people in poor circumstances on the land, but to open opportunities to them, and migration to cities and beyond will always be part of this.

- And when the economics of the drylands are regenerated, whether through agriculture, tourism or mining, the poor people must be beneficiaries, and benefits should not continue to be siphoned off into capital cities.

D. Biodiversity in drylands

Since the word biodiversity metamorphosized from a term of scientific discourse to a popular code word for environmental crisis, it has also come to be equated with the tropical rainforest, earth's great engine of species creation. While less diverse (and less studied), the world's drylands contain significant numbers of species, including several of the largest land animals on the planet. Humanity itself is a product of the drylands, as are many of the things we eat.

Of most immediate interest are the genetic reservoirs of crucial staple crops such as maize, wheat, and barley, upon which a good portion of earth's 6 billion people depend for sustenance. Within various land races of these staple crops are adaptations to disease and drought that will prove vital as threats to wheat, corn and other endemic dryland crops emerge. If overall dryland species diversity is not as great as the rainforest, within species diversity is far greater as flora and fauna adapt to widely diverse dryland habitats with steep ecological gradients. The geres of species in very arid lands contain myriad ingenious adaptations to harsh conditions ranging from water deprivation to extreme heat, which may prove increasingly important should climate continue to warm.

What the drylands lack in species diversity they make up for in their ability to support animal biomass. Some of these water-deprived regions such as the Great Plains in the United States and the Serengeti Plain in Africa have supported the greatest tonnage of animal life assembled on earth. Studies in India and Africa suggest that there is much that livestock stakeholders can learn from the ecosystem's ability to support vast numbers of animals in a harsh climate with sparse and intermittent ground cover.

Some of these lessons have already been acquired by the pastoralists of dryland areas who are forever on the lookout for adaptations in livestock that give them an edge against disease or drought. Herders in Africa graze as many as 150 varieties of cattle, 60 different strains of sheep, and 50 different goats in various habitats. Many of these animals are the product of breeding efforts to

amplify adaptations to a harsh habitat.1/ In eastern and southern Africa, the Sanga family of cattle has been bred for resistance to East Coast Fever, while in West Africa, farmers have bred dwarf breeds of cattle, sheep and goat that resist sleeping sickness.

For all their vast sweep, and the hardiness of their endemic species, drylands remain extraordinarily vulnerable to human impacts. Around the world, grasslands are under pressure from conversion to agriculture, urbanization, and the introduction of harmful non-native species. As grasslands become fragmented, they lose their capacity to support biodiversity. In other cases, the biodiversity itself is the target, literally. In many sub-Saharan nations, poaching has virtually eliminated populations of large mammals. Even in protected areas, animals are being poached. Apart from immediate threats, drylands live under threat from afar; as richer, populated areas dam or divert rivers and overexploit aquifers, further stressing the dryland's precarious water budget.

The challenge facing policy makers in the near term will be to adjust the imbalance of funds available for biodiversity so that the dryland's biodiversity issue begins to receive resources commensurate with its importance to humanity and the biosphere. Research has been underfunded for decades with the result that there are vast gaps in knowledge, not only on the interplay of human activities and dryland ecologies, but also concerning species distribution and ecosystem dynamics.

Another pressing concern is the integrity of the food supply. It should be a priority to explore ways to protect wild dryland regions that are home to the ancestral strains of staple crops and provide incentives for the continued cultivation of the land races of these staples. There is no laboratory substitute for a crop adapting in its native habitat.

Biodiversity issues should be integrated into development planning wherever possible. Where environmental appraisals are required, impacts on biodiversity as well as soil and water should be addressed. Indeed, given the scope of degradation in drylands, environmental impact appraisals, including impacts on biodiversity, should be mandatory on all development assistance.

Environmental review is standard procedure on almost all large infrastructure projects, but small projects often pass without such appraisals despite the fact that minor projects can have major impacts. The varied ways in which seemingly innocuous projects can impact the environment were well illustrated in Malawi. In the mid 1990s, the World Bank approved an education project in which the bank funded the costs of teachers while local communities provided school buildings. School buildings require bricks, and a huge spike in demand for fuel wood to fire brick-making kilns added significantly to the depletion of already over-exploited trees.

In general, biodiversity needs to move towards the center from its current position on the periphery of development planning in the drylands. Arid region farmers and pastoralists recognize the value of diversity in their hedging strategies by planting an array of crops adapted to different stresses and grazing an array of animals. This provides an intuitive basis for understanding the resilience that biodiversity contributes to the dryland ecosystems. Research and

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1 Mc Corkle, M.C. 1999. *Africans Manage Livestock Diversity*. Compas Newsletter for Endogenous Development : 14 - 17

outreach programmes can help identify and publicize ecosystem services provided by dryland biodiversity, starting with fundamentals such as soil and water conservation, providing a first line of genetic defense for crops and livestock, and providing the code for natural solutions to the challenge of living in extreme conditions. To merit the term sustainable, development decisions must integrate the benefits of such environmental services and recognize the costs that come with the loss of biodiversity.

E. Climate change

Even without climate change, the drylands face a daunting array of threats. Population pressures, social changes such as the settlement of formerly nomadic peoples, exploitive agricultural and grazing practices that foster deforestation, soil erosion, salinization and water depletion, and a host of political and institutional problems have conspired to degrade 20% of the world's drylands, including 22% of Asia's susceptible drylands, and 25% of Africa's.

Changing climate might benefit some drylands. One climate model that has been discussed suggests that the more arid regions of the Sahel (Mauritania, Mali and Niger) may actually get wetter, whilst sub-humid zones of Burkina Faso, Mali & Ghana will get drier. However, other models suggest that the majority of drylands will be adversely impacted. Where there is diminishing rainfall and an increase in droughts the pace of dryland degradation will increase, as ordinarily tolerable activities such as grazing and firewood collection place an untenable burden on the land. In nations struggling to build infrastructure, extreme weather events could wipe out years of development and hobble a nation's capacity to cope with new emergencies. The world had a preview of these costs of climate change when in 1999 in Mozambique a few weeks of floods related to a strong El Nino wiped out the equivalent of a decade of economic growth.

In the past, one reaction to drought has been migration, particularly of young men. Families do not uproot their lives except in extreme circumstances, but the effects of climate change might well produce a surge of migration out of drylands. While migration can result in a healthy redistribution of humanity as people seek more viable lands and new opportunities, more and more migrants find themselves pushed by famine or drought towards havens that are already occupied.

What can be done? A useful and sobering first step would be to review the record of past efforts to help the dryland regions. Most of the predicted impacts that climate change will bring to the arid regions involve an increase in frequency and severity of problems that dryland residents have been coping with for millennia. Dryland problems have been studied intensively for decades, and, indeed, around the world's scientists and engineers have developed drought resistant cultivars, water efficiency techniques, as well as an understanding of the dynamics of grazing and desertification that have produced some remarkable successes in the preservation and restoration of drylands. The contribution of the Consultative Group on International Agricultural Research (CGIAR) in food production through varietal improvements in dry marginal areas is notable in this regard.

Unfortunately, such success stories are more the exception than the norm. All too often, even where knowledge is available, it is not used; or where it is available and used, it is not deployed effectively. Or, knowledge will be applied in good faith but still produce contrary results because some innovation works at cross purposes with ingrained traditions or produces some unintended consequence. Small-scale irrigation development in valley bottoms of dryland areas contributed

to food and cash crop production, but also tended to take over dry season growing reserves of pastoralists.

Even where governments, communities and individuals make a concerted effort to control destructive practices, there is often a frustrating time lag before dryland residents see some benefit from their efforts. If remedial measures do not produce results in a timely fashion, the pace of the slide towards desertification can overwhelm the best efforts of alarmed and highly motivated people.

Many other factors, including corruption and simple incompetence have muted the impact of numerous national and international efforts to halt the decline of the world's drylands. In recent years, a number of Multilateral Environmental Agreements (MEAs), including the Convention to Combat Desertification and the Convention on Biodiversity have included or adopted initiatives to benefit the drylands. As yet, however, efforts at the level of MEAs have produced little more than the comforting and misleading appearance that the problem is being addressed. All too often the dialogue and resources originate in multilateral agreements and then dissipate before reaching the landscape and its peoples.

It would be most unfortunate if this frustrating pattern continues with the United Nations Framework Convention on Climate Change. The UNFCCC, for instance, calls for the poor arid nations to prepare inventories of their greenhouse gas emissions, a bureaucratic burden in regions with some of the lowest per capita emissions on earth. In these countries, resources might be better directed towards bolstering the capacity to adapt to climate change. (During the latest Conference of the Parties for UNFCCC, in Bonn, the parties acknowledged the need to consider adaptive measures).

Despite these cautionary words, the dryland regions have some strong advantages as their governments and peoples prepare for climate change. More than most of the world's climactic regions, the drylands have a running start in such preparations if only because the threat of climate change is a more intense and frequent version of climate variation that arid regions have contended with since the dawn of history. The past decades have also produced an arsenal of technical and social tools that could prove vital if institutions and governments ever crack the code as to how to effectively deploy these weapons. Programmes to adapt to climate change can integrate activities designed to respond to drought and desertification. By pushing ahead now, governments will be much better prepared to adapt should precipitation patterns change for the worse in the coming decades. Since need vastly outstrips resources today, there is no downside risk for governments that assume a proactive stance.

A major underutilized resource resides in the knowledge and initiative of the dryland peoples themselves. If multilateral initiatives are to actually produce results on the ground, they must be palatable and appropriate to a great variety of dryland cultures, all of which at some point embodied adaptations to the rigours of scarce and uncertain supplies of water. In Kenya, attempts to provide water to pastoralists during migration south by drilling boreholes backfired because they produced such a convergence of livestock that they caused massive destruction of ground cover. One lesson of the past has been that development efforts have relied too much on prescriptions applied without sufficient understanding and sensitivity to the drylands communities.

This time around, stakeholder involvement, transparency and openness should

be guiding principles in the development of dryland programmes. At the national level, governments should consider coordinating various initiatives on biodiversity and desertification that are now fragmented in different ministries. This consolidation - encouraged by the International Strategy for Disaster Reduction - could eliminate redundant efforts.

Looming over any bureaucratic tinkering, remains the larger question of the commitment of governments to fulfill their end of the social contract. Over time, nations thrive or fail to the degree a people and their government honour this mutual understanding of rights and responsibilities, whether the social contract is enshrined in a constitution, or exists as an unwritten code. A fundamental prerequisite for success in dealing with such major threats to the survival of societies is good governance.

This same question of legitimacy and good governance will also play a role in the success or failure of international environmental and development agreements. As the global community struggles to address environmental problems that ignore national borders, it has become clear that something akin to a global social contract must emerge in which those nations that contribute most to climate change or environmental degradation and those that suffer the economic and social consequences recognize their rights and obligations. The issue of legitimacy lurks behind as yet unresolved issues in the Kyoto agreement. Achieving some sort of understanding of the rights and responsibilities of rich and poor nations, as the world attempts to come to grips with global issues, will be an overarching challenge in this new century.

F. Vulnerability and adaptation to climate change in the drylands

Written by Ian Burton

1. The Challenges

How can adaptation to climate change be made more effective and integrated with activities linked to other multilateral environmental agreements, such as the Convention to Combat Desertification and the Convention on Biodiversity? This integration is needed at international and national levels, but especially at the local level.

How can we agree on a global social contract that reconciles the need to address jointly global environmental change, national development objectives, and local priorities?

2. The Nature of Climate Risks and Vulnerability

Recent reports from the Intergovernmental Panel on Climate Change (IPCC 2001) confirm without doubt that climate change is now occurring, and they suggest a larger and more rapid rate of change than was thought likely only five years ago (IPCC 1996). While uncertainties still persist about the changes likely to occur in any particular place, the general direction of global change is no longer in serious dispute. The global climatic patterns within which human activity has adjusted over hundreds of years are showing increased disruption at a rate not experienced before (IPCC 2001). Average temperatures are increasing, and higher associated rates of evaporation will bring drier conditions, especially in the interior of major continents (IPCC 2001). Total rainfall amounts may increase in some regions, but variability is likely to increase so that droughts will become

more frequent and intense, while rainfall will be concentrated in shorter and more severe storms (Karl, Knight, and Plummer 1995).

What will be the impacts of broader global climate change on dryland areas? Such predictions are difficult because they depend on the assumptions and models used. In the case of West Africa, for example, recent research presents a range of possible rainfall scenarios. The first suggests a considerable drop in rainfall, rise in temperature and increased rainfall variability, especially at the start of the rainy season. The second, by contrast, indicates that the more arid regions of Mauritania, Mali and Niger may actually get higher levels of rainfall, although less rain is forecast for the sub-humid zones of Burkina Faso, Mali and Ghana (Haramata 2001).

It has proved particularly difficult to include in predictive models the effects of the El Niño variation, and role of dust levels in the atmosphere (Hulme 2001). In the circumstances, given the considerable uncertainty attached to rainfall predictions, it may be more productive to emphasize monitoring weather patterns, to ensure effective early warning systems, so that countries are well-prepared in the event of a drought or flood. Equally, given the possibility of more intense rainfall events, greater encouragement is needed at field level for long-term investment by farmers in soil conservation measures, to reduce runoff and erosion, and to maintain a good level of ground cover.

Developed countries in the higher latitudes are expected to experience a greater change in climate than those in tropical developing countries. Yet the vulnerability of tropical developing countries is likely to be much greater, due to their lower level of adaptive capacity (IPCC 2001). Where people have financial resources, access to technology, high levels of education and training, good health, security, strong institutions and effective organizations, they can more adequately cope with exogenous changes, shocks, and impacts. Where these attributes of adaptive capacity are low, vulnerability is correspondingly greater.

This observation applies at all levels of society, from the individual and family group to the community, nation and region. The world' s hot drylands constitute one of the planet's most vulnerable regions (World Bank 1999). They suffer from a rainy season lasting just a few months, and a significant shortage of water resources for most of the year. This is compounded by the unreliability of rainfall, and the threat of recurrent drought. Traditional practices to help cope with drought include the accumulation of a surplus in good years, in cash or assets such as cattle, and the use of this surplus in order to survive the bad years. Other strategies include mobility, the use of diverse crop and livesto.k varieties, the pursuit of off-farm activities, and migration to earn cash during the long dry season.

Where drought increases in frequency and intensity with climate change, it becomes harder to accumulate a surplus in the good years, and the bad years come more frequently. The first to feel the impact are the poor with the least adaptive capacity, but no social group, and no nation can consider itself immune from the threat of progressive desiccation. In international debates about climate change, the vulnerability of small island states has been dramatically described. The very existence of some island nations is threatened by rising sea levels. If the worst case rainfall scenarios are borne out, the circumstances faced by some dryland countries may be no less extreme. While small islands may be drowned beneath the waves, if rainfall declines substantially, some dryland nations will find themselves unable to cope.

3. Growing Vulnerability

Even without climate change, many people in the drylands are becoming more vulnerable, especially those living in rural and dispersed communities. This is a result of various processes which include the impacts of macro-economic developments which are reducing the value of agricultural commodities, making competition more intense, and increasing the cost of inputs, limited access to markets, and a large burden of debt. It has been estimated that one billion people now live in poverty as a result of land degradation (Johnson 1999), and the number is growing. Many of these people practice semi-subsistence agriculture or pastoralism, producing a small surplus in good years to sell or barter for needed goods and services (US Famine Early Warning System 1992).

Typical coping strategies are usually described in relation to the degree of vulnerability and impacts on livelihoods. These strategies tend to amplify and extend normal ways of making ends meet. Where vulnerability is slight or moderate, coping strategies include selling less important assets, husbanding resources, drawing down food stores, reducing the amount of food consumed, and the sale of smaller livestock (goats and sheep). Where vulnerability is higher the process of liquidation is extended to more important assets (cattle, bicycles, jewelry), and alternatives are sought such as daily wage labor often away from the community, and more intensive harvesting of wild resources, such as selling firewood or charcoal. Other strategies include borrowing from local merchants (often at very high rates of interest), and more or less permanent migration of younger people in search of employment elsewhere.

Depending upon the degree of vulnerability, various forms of intervention are possible. The best is to find ways of strengthening local people's own coping strategies, and help minimize losses of wealth and productive assets. Governments and donors can also try to mitigate drought impacts by provision of emergency water supplies, the release of food stocks, relief and asset support (food-for-work and cash-for-work programmes), food relief, provision of seed packs and the like. In cases of severe drought, there may be little that outsiders can do little except provide emergency relief (food, shelter, medicines). However, such measures do not address the root causes and, if poorly judged, merely create conditions that increase the risk of a new disaster (Downing, 1999, Miletti, 2000).

This litany of shortcomings provides evidence of the many constraints which make dryland people vulnerable to risk. Two lessons might be drawn at this stage. The first is that short-term piecemeal palliatives will not solve the problem of vulnerability in the drylands and can easily make things worse. The second is that present efforts are too fragmented and that a much broader, more powerful

integrated strategy is required. Such a strategy needs to place drylands within a larger global setting and which understands the dynamic relations linking people, goods, livestock and market opportunities in dryland and higher potential areas. Reports repeatedly affirm that there is much potential promise in the world's drylands, on which governments should build. But there may also be some areas, which have become so degraded that long-term measures are needed to help rehabilitate the resource base. These will require a mix of technical, institutional and economic elements, including support to alternative means of livelihood, either in situ or elsewhere.

4. What is Meant by Adaptation to Climate Change?

Adaptation refers to "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC 2001. p. 982) .

Virtually all human economic activities are influenced by present climate patterns. This applies not only to such obviously climate dependent sectors as agriculture, pastoralism, forestry, and the use of water resources, but also to human health (the distribution of many disease vectors is climate dependent) and all infrastructure, including housing, communications and transmission lines, roads, bridges, harbors and the like. Ideally, the design of these facilities should be determined not so much by normal or average climatic conditions, but by climate variability and extremes. Bridges and buildings in developed countries are commonly designed with a safety factor to withstand at least a 100 year event. In poorer developing countries, the design standards are often much lower, or not enforced. Climate change is likely to bring an increased incidence of extreme events, with for example 100 year floods occurring every 20 to 30 years.

Viewed from a global perspective the present level of human adaptation to climate is high. It has enabled people to occupy and make a satisfactory livelihood in most climatic zones on the planet. But not all regions and peoples are equally able to cope with our increasingly disrupted climate. The rapidly increasing losses (both insured and uninsured) from extreme climatic events such as floods, droughts, and tropical storms shows that vulnerability is increasing most notably in the poorer developing countries and especially among the low income people in these countries. The dryland regions are recognized as being among the most vulnerable.

This increase in current vulnerability is partly related to the expansion of human settlement into more hazardous areas, such as flood plains, steep and unstable hill slopes, low lying coastal zones, and areas of lower and more uncertain rainfall. Other factors include low quality of construction, and the increase in quantity and value of property and material goods. While the damage in monetary terms from climate variability and extremes is also increasing in developed countries, the level of losses appears to be a more or less a constant proportion of gross national product. In other words, losses are increasing in proportion to the increase in wealth (Burton, Kates and White 1993). In many developing countries, however, losses are increasing more rapidly than the increase in national wealth. In the case of some recently reported extreme climate events (hurricanes in Central America, floods in Mozambique), the losses recorded in a few days are equal in value to a decade or more of economic growth (ISDR 2001, Munich Re 1999). Even without climate change, current extreme events can be a significant setback to development. This has long been a well recognized phenomenon in drought prone regions, and is now coming to be recognized for other types of climatic

hazard as well.

Under the terms of the UNFCCC, developed countries have agreed to "assist the developing country parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation to those adverse effects" (Article 4.4). In negotiating the text of this agreement the developed countries made it clear that assistance is to help meet the additional or incremental costs of adapting to climate change, and does not apply to the costs of mitigating natural disasters, or that component of disaster losses, which may be attributed to 'normal' climate variability. Since the scientific basis for making this distinction does not exist, the required level of adaptation assistance remains a matter for negotiation, as does the distribution of such assistance among vulnerable countries, and the manner in which vulnerability and adaptation priorities are to be assessed.

Nevertheless, there is a commitment in principle from developed countries to provide assistance to help meet the costs of adaptation to climate change, which goes beyond normal development assistance, and perhaps carries additional moral weight than promises to help combat desertification or loss of biodiversity. This is because climate change is clearly linked to the much higher level of greenhouse gases emitted by developed countries. As such, they have a responsibility to help mitigate the impacts on vulnerable developing countries. Such evident and directly attributable links between the actions of developed country and the vulnerability of developing country are much less apparent in the case of desertification and biodiversity loss.

There is a growing divergence between the priorities determined in global negotiation of multilateral environmental agreements and the priorities of specific countries, especially poor developing countries (Burton, 2000). This conflict presents a major challenge to the international community, and requires a policy regime that can reconcile this divergence in an equitable and sustainable manner.

5. Climate Change and Development

For the world's drylands, the threat of climate change is not something completely new. It adds to the current problems of drought and desertification, and compounds their poor development prospects. Hence a major priority for countries in the arid and semi-arid zones is to strengthen their ability to adapt to the potential threats of climate change (Apuuli, Wright, Elias and Burton 2000). This priority diverges significantly from the underlying objective of the United Nations Framework Convention on Climate Change (UNFCCC) which is stated to be "to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (Article 2).

Under the UNFCCC, the poorer and least developed countries, many of which are in water deficit regions, have been asked to prepare inventories of their emissions of greenhouse gasses, despite these being very low in both absolute and per capita terms. By contrast, their need to strengthen adaptive capacity has received scant attention (IPCC 2001). Recent decisions at the 6th Conference of the Parties to the UNFCCC (Bonn, July 16-27 2001) on the need to support adaptation are a sign that this situation may be changing. But, this shift in priorities could well prove a false dawn, unless adaptation to climate change is effectively integrated into national economic development plans, and these plans receive adequate support.

Most research carried out on climate change in the drylands has concentrated on the potential impacts, especially on physical and biological systems. The consequences for socio-economic development have barely been considered beyond the listing of possible adaptation measures. Those most often proposed to deal with climate change bear a remarkable similarity to measures frequently proposed for responding to drought and desertification. This confirms the views of IPCC (IPCC 2001) and others that adaptation to climate change should not be seen as something requiring an entirely new approach. The task is to make sure climate change is taken into account in programmes and activities already underway. The risks of climate change add further weight in favour of addressing the needs of the poorest and most vulnerable countries and communities, which are finding it difficult to cope with current conditions.

6. An Intractable and Deteriorating Situation

Even without climate change vulnerability in many drylands countries is increasing. The failure of development to keep pace with population growth is serving to increase the number of people living in conditions of poverty. Where the margin of accumulated surplus is small and diminishing, there is little prospect of being able to adapt to the additional threat of climate change. National governments commonly have insufficient capacity to address current needs and priorities. Hence, the notion that national resources can be diverted to cope with climate change, is unrealistic. Recognition of the climate change threat serves to emphasize the need for policies that put long-term sustainable development at the core. In extreme circumstances, some regions may become so dry that attempting to maintain population levels at present density in these regions is likely to prove to be an exercise in futility in the long run. In such circumstances, a combination of policies would be required to promote new forms of adaptation, including support to non-farm occupations, encouraging mobility and migration, as well as increasing access to education as a means to 'escape' to better opportunities elsewhere. Such changes would be difficult to manage and would be likely to have other serious impacts, such as an ageing of the demographic structure of rural communities, as younger people leave for jobs elsewhere

Numerous observers note that many of the poorer developing countries are experiencing a rapid degradation of their natural environment. This is often presented to be both a result and a cause of poverty, in the form of a vicious cycle. In recognition of this situation, a number of multilateral environmental agreements (MEAs) have been negotiated. The Conventions on Biodiversity and Climate Change were signed at the Earth Summit, in 1992. At the same time, agreement was reached to start negotiating a Convention to Combat Desertification that was signed in 1994. In the case of the CBD and CCD, parties have been committed to prepare National Action Programmes, but little action has resulted from these, as yet. Under the terms of the Climate Convention, calls are now being made for the preparation of NAPAs (National Adaptation Programmes of Action) for climate change.

Will the additional threat of climate change make any substantial difference to the management of these and other environmental problems? Will the urgent need to adapt to climate change generate commitment from governments, or suffer the same fate as plans for combating land degradation, desertification, and loss of biodiversity? And how might this be achieved in ways that meet the needs of different countries?

7. The Paths to Improvement

Proposed efforts to combat desertification, reduce biodiversity loss, and adapt to climate change, as outlined by the various multilateral environmental agreements concerned, do not always respond to the policy priorities of the countries most at risk. The former (MEAs) tend to focus on the technical and social constraints associated with specific problems. These include such proposals as the improved management of recurrent crises, emergency preparedness, and the difficult process of reducing vulnerability by incremental improvements in natural resource management, the efficiency of production and the like. At the policy level, attention focuses on the macro economic conditions of poverty, adverse trade balances and so forth. The latter tend to focus on sustainable development activities, especially at the community level.

The following six questions may be used to attempt a better diagnosis of the issue of growing vulnerability in the face of climate change and identify the policy issues and initiatives needed at local and national levels with appropriate international assistance.

1. Is knowledge lacking and if so in what areas?
2. Is knowledge available but not used?
3. Is knowledge available and used, but not deployed effectively or with contrary results?
4. Is knowledge available and used effectively, but simply requires time to take effect? Is there in words a time lag?
5. Are the best efforts in the application of knowledge simply overwhelmed by the growth of vulnerability and the pace of environmental change?
6. Is the context in which knowledge is used inappropriate or ineffective?

8. Lack of Knowledge?

The problems faced by dryland areas have been intensively studied for decades. Considerable understanding now exists of the sources and character of vulnerability. The processes of environmental degradation are also well understood, as well as the conditions that can lead to environmental improvement. Appropriate science and technology have been developed to improve the efficiency of water use, to develop drought resistant cultivars, and to manage rangelands and grazing densities. There has been considerable progress in understanding the policies needed to underlie investment by local people in dryland areas, which require a combination of factors:

Institutional: whereby farmers feel secure in their rights of access to and control over land.
Technical: ensuring that farmers have at their disposal techniques for improving the productivity of their soils and farming system.
Economic: providing farmers with both the means and incentive to invest in improved land husbandry.

Uncertainty persists about the possible extent and rate of climate change, and about what the most effective adaptation responses might be. While more research and development on these and related questions have potential value, lack of knowledge is not a primary constraint. The broad direction to be taken is clear. This does not mean that the search for new knowledge and technology should slacken since, in the long run, greater understanding and better technology are essential. However, investment in research is not by itself a sufficient response.

9. Is the Available Knowledge Not Used?

More knowledge about the problems of drylands exists amongst scientific experts, and in the schools of resource management (including the health and engineering professions) than is put to good use. There are many reasons for this. Knowledge is not well distributed and, even when it is theoretically available, it is often not in a form that is useable by those in need. When these constraints are overcome, new knowledge often runs into conflict with traditional practices, social and legal conventions, and the existing power structure within communities and nations. Knowledge is often seen in isolation, as a technical fix, rather than being discussed, evaluated and "married" to local skills and perceptions. When and if these constraints can be overcome, the lack of financial resources or accumulated surpluses even for small incremental investments often prevents improvements in the desired direction. Improved access to micro-finance loans can make a big difference here, so long as there is also an economic incentive and market access from which such investment can benefit.

The more widespread use of available knowledge would certainly be helpful in many instances. This suggests the need for better information and extension services, and for community and stakeholder participation in the development and choice of adaptation options. Neither of these measures will be of much avail unless there is a real prospect of access to financial resources, such as small loans, which can be of great help in fostering innovation.

10. Can Knowledge be Deployed More Effectively?

The dangers of outside intervention are well known. The prospect of donor support is disturbing to community power structures, and can distort priorities. Self-reliance and sustainability can be strengthened, but where development initiatives fail or are only partially successful greater dependence can be created. Perverse and contrary results are not unknown. New wealth, even in small amounts can be misallocated in ways that increase rather than reduce vulnerability. Knowledge can be deployed more effectively but diligence is required if this is to be achieved, and processes should be open and transparent. It should be recognized that 'knowledge' is not an abstract commodity that can be inserted into dryland systems. There is also local knowledge - successful drylands management has usually been the result of careful fusion between local knowledge and selective use of external ideas.

There are grounds for concern about current proposals to create new international funds or "windows" for adaptation to climate change. Where measures are not carefully integrated into national economic development planning, there is greater chance they will be used ineffectively. The causes of vulnerability need to be recognized and reasons for the lack of success in achieving significant reductions over the past 3 or 4 decades of effort need to be analyzed. As noted above, there has often been too much reliance on prescriptions and not enough

understanding of local processes, priorities and the dynamic of local communities; including relations between the landed and landless, men and women, and different sub-groups or cultures. Sensitivity to local conditions, their variability and dynamics is crucial.

In the case of climate change, much emphasis has been placed on quantitative modeling studies based on climate change scenarios that provide projections of future climate. Modeling impacts of climate change on dryland agriculture by the year 2050, and assessing adaptation options may help to compare the impacts of climate change with costs of reducing greenhouse gas emission. But, this form of analysis has little relevance for policy makers in situations where vulnerability is already high and adaptation measures are insufficient for current needs (Burton and Lim 2001).

11. Is there a Time Lag?

The fact that development efforts can fail to achieve positive results in good time is often attributed to the complex processes of social change and innovation. Even where knowledge is available and deployed widely, results may be a long time coming. On the other hand, efforts to prevent desertification, reduce biodiversity loss, and adapt to climatic variability have been underway for decades, and yet vulnerability continues to increase in many areas. Certainly, there is a time lag, and persistence is required. But the evidence suggests that continuing simply to do more of the same will not suffice to achieve more sustainable livelihoods for the world's dryland peoples.

12. The Growth of Vulnerability and the Pace of Environmental Degradation

There is another more powerful explanation for the continued growth in vulnerability, despite the efforts of governments, development agencies, civil society and the private sector. The strength and momentum of the forces that drive the cycle of poverty and environmental degradation are overwhelming in relation to the magnitude of resources that have can be deployed against them.

Taken together, the five points outlined above help explain the growing vulnerability faced by many peoples. The new focus provided by discussions within the FCCC and the need to adapt to climate change offer both opportunities and risks. It is probable that new and additional financial resources will be made available to vulnerable countries to adapt to climate change. Prominent among such vulnerable countries are those in arid and semi-arid regions with considerable areas of dryland. If additional funds are to be used more effectively, we need to keep in mind the importance of generating new knowledge; better diffusion and deployment of knowledge; more effective use of knowledge; stakeholder involvement; transparency and openness; and patience in the face of slow progress. Other conditions include access to micro-credit, greater public awareness, more training, and easier access to technology. However, even if all these requirements can be met, broader macro-economic factors are clearly critical in providing the wider context within which dryland peoples must make choices regarding production and investment.

13. The Context of Development Initiatives.

Recent experience with multilateral environmental agreements has encouraged a fragmentation of efforts in dealing with global environmental change and development. In many countries there now exist separate offices responsible for desertification, biodiversity and climate change. These may be housed in different ministries, and pursue independent, poorly coordinated, and even conflicting objectives. Although there is no international convention on natural disasters and their prevention, a similar set of institutional arrangements has been encouraged by the International Decade for Natural Disaster Reduction (1991-2000), and its successor activity the International Strategy for Disaster Reduction.

Activities related to these Conventions have focused on the constraints described above. Often the suggested remedies have been at the technical level, as found within national action plans. But their results so far have been modest. The confirmation of global climate change, and need for adaptation measures have brought added impetus to other multilateral environmental agreements such as the Convention to Combat Desertification. Proposals for National Adaptation Plans of Action to be drawn up under the Climate Convention should be examined with caution. How can these avoid becoming yet another displacement activity, which absorbs energy and diverts attention from the real issues?

14. The Real Issues

The real issues concern the possibility of reaching fair and sustainable agreements about tackling global environmental change in a highly diverse and unequal world. At the level of the nation state, disputes between different actors can be managed through the political process, by which the winners can compensate the losers. Citizens accept the authority of government under the terms of a social contract that specifies the mutual rights and duties of citizens and government. Since the days of Thomas Hobbes and Jean-Jacques Rousseau, we take for granted this unwritten social contract that provides the glue which holds society together.

By contrast, the emergence of a few truly global environmental problems in the late 20th century has focused attention on the lack of a social contract at global level. The contentious nature of the issues, divergence of interests among countries and absence of an agreed system to redistribute benefits and costs between winner and losers have jointly served to prevent effective action. At the same time, debate on environmental change has been caught up in long-standing tensions between different country groups and associated disputes regarding trade, debt, and aid. Thus, while globalization proceeds rapidly in communications, trade, and financial realms, the resolution of global environmental issues remains far more intractable.

Efforts to overcome these difficulties follow two different pathways. The first involves more technical, practical "bottom up" approaches that seek to address specific issues at local level, but often in isolated or poorly coordinated ways. This has led to fragmented efforts which can claim some modest success but which have not spread on a sufficient scale to prevent growing vulnerability. The second route has taken a macro level "top down" approach. Major international conferences, such as the United Nations Conference on Environment and Development, or Earth Summit, held in Rio in 1992, have generated ambitious plans on paper, most notably Agenda 21. But, despite the enthusiastic rhetoric employed, and the momentum created for a short time, such conferences and plans have proved

disappointing in the longer term. Similarly high level commissions have studied the issues and made far reaching recommendations, such as the World Commission on Environment and Development. Their report, Our Common Future, was given a positive reception internationally, and helped to launch the concept of sustainable development. But progress in such a direction has proved painfully slow.

Meanwhile, the rapid globalization of the world economy is adding further strains to the unbalanced relationship between rich and poor countries, their opportunities for economic development, and the need to protect the global environment. Such inequities cannot be sustained indefinitely. The challenges posed by climate change and urgent need to reduce vulnerability and strengthen adaptive capacity, demand that multilateral environmental agreements be more strongly integrated and harmonized. The activities, policies, and measures proposed by such agreements can only be addressed by being set within broader national and global development policies. This means integrating environmental issues within the agenda of trade, debt and global poverty.

15. Summary of Challenges

The joint challenges of climate change, biodiversity loss and dryland degradation require an integrated approach. Particular attention is need for the points discussed above, and outlined below:

Greater knowledge is needed in many areas. But what should be the balance between more technical research on the one hand, and better understanding of the social, economic and institutional barriers to change? What can research contribute to removing obstacles?

Why is available knowledge not used as effectively as it should be, and what steps should be taken to ensure that knowledge reaches those who need it in a form that can be acted upon? How can a more effective union of local and external knowledge be achieved?

Why is there such a large gap between the top down prescriptions made at national and international levels, and the bottom up needs as seen from the local and community level? What can be done to change this?

Why do results take so long to achieve? Why is there such a time lag between ideas and implementation and what can be done to reduce it?

Why is the national and international effort so small in relation to the size of the task? Are current efforts being misdirected towards short term palliative measures rather than addressing the longer-term root causes?

Is the fragmentation of policies (desertification, climate change, biodiversity, natural disasters etc.) a major cause of ineffectiveness? How can these policies be better integrated locally, nationally, and internationally?

These are some of the challenges facing people and decision-makers working to encourage more sustainable livelihoods for the world's dryland peoples. This is a collective global responsibility, which needs a shared response. The ever-growing impacts of climate change add a further urgency to this global challenge.

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Annex II

SUBMISSION BY SWEDEN

Desertification and land use
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The Challenge

Rational land use as a sustainability goal

Investment in commercial marketing, changed consumption patterns and growing pressure on pasture lands have lead to widespread commoditization of land in arid and semi-arid areas. Land use turns towards ranching systems through privatisation. This means lowering productivity.

The issue of land use has lead to a situation with constant uncertainty about land rights a for dryland inhabitants. The challenge for sustainability is to find land use forms that build on existing skills in order not to decline into ranching systems. The access to land then has to become a major issue.

The need for good governance

Uncertain ownership conditions cause rapid deterioration of lands when the occupier tries to squeeze out a maximum during a short period. This observation is valid also for drylands, although being complicated through extensive livestock rearing practices (pastoralism). Resource care under range conditions becomes oriented towards livestock and not towards land. In contrast to farmers, pastoralists hold the view that land access is not the sole basis for food security in drylands. Their security perspective is connected with the family enterprise of pastoral production. It involves balancing land use, livestock production and local social institutions.

The challenge is to place land use into its socio-political frame. Openness and long-term solutions are in the interest of sustainable development also when implications are major changes in land use. By avoiding conflicting interests all long-term planning is blocked, and short-term destructive land use becomes more prevalent. This means:

1. Desertification is in part a symptom of mal-functioning land use systems. Good governance is required for balancing the interests of different stakeholders, all the way from community level to national level.
2. Customary land use do not have the capacity to meet growing pressures on land in the form of more people, more claims and less available pastures. Existing local institutions for land use need to be reinforced or supplemented.
3. For historic reasons many political boundaries cut through drylands, calling for regional approaches and international co-operation.
4. Expanding alternative land use forms, particularly farming, into drylands has brought increased vulnerability into livestock production. Poverty issues for drylands need to be connected with new land use forms and alternative sources of income rather than being directly linked with land degradation.

5. In modern legislation loan security is tied to land and not to livestock. In drylands private investment is commonly made in livestock while pasture access is seen as a public good. New security forms are needed that are not entirely land use based.

Policy formation on land use need to be pro-active towards sustainable resource use practices. This means not merely conserving drylands but rather encouraging sustainable systems change. Good governance is called for in order to balance stakeholder interests. Mass education at local community level is important. Planning includes the involvement in market economies and globalisation. Issues that are dryland specific must be taken into consideration in order to launch pro-active policy.

Key issues for discussion

1. How can open access to drylands be avoided? For instance: What constraints can be (need to be) placed on settlement in, and use of, drylands? How are the interests of various stakeholders accounted for? Can customary use rights be balanced with democratic rights to live anywhere in one's country? Is good governance capable of balancing interests in a sustainable manner?

2. What kind of developing country policies are needed to put into place security of land use for poor people? For instance: What use rights can be associated with land rights in pasture, water, wildlife, landscape/tourism, energy, mining? When is a principle of subsidiarity applicable? Are corporate land use forms compatible with society's needs for economic security for loans and investment? What are the constraints and capacity of community-based use? What collaborative mechanisms are needed to be promoted among poor people in order to generate reasonable productivity?

3. How can long-term reliability be secured for vulnerable social groups? For instance: Can the general association between poverty and life in drylands be scrutinised? How can the situation of socially vulnerable categories (women, children, poor strata) be improved through policy formation?

4. What should donors do to promote such a desirable redirection of policies and strengthening of institutions?

Meeting the challenge

Modify production forms

Land use in drylands has been associated with collective customary rights. The common livestock based economy relies on extensive grazing or browsing. Mobility and flexibility have brought high productivity to such pastoral systems. Elaborate local social institutions have managed decision-making about land use, and user rights have been associated with social groups. When operating within local contexts such systems have proved highly effective in productivity terms, and seemingly also with upheld sustainability. These local social institutions have, however, collapsed under growing constraints through pressure on land, livestock populations and demography.

These constraints have lead to a poverty situation in instances where communities lack capacity to secure food access. The equity issues have for long been concerned not with land but with livestock and livestock products. Pasture lands have been seen as a common good, with cultural restrictions such as tribal lands, reserve pasture lands or the like. But as such systems have come under increasing pressure, through extension of farm areas, through the introduction of new technology for livestock production, and through involvement in a global market

economy, vulnerability has increased. Customary use rights have not been able to meet growing pressure on land; more people have claims on land at the same time as the cultural local institutions become less effective and conflict with national and regional authority systems.

Two schools of thought have emerged out of the acute land use situation for drylands, especially in Africa. One suggests privatization of land, and the other collective use rights associated with legally defined user groups. The first line means fencing and declining the flexibility of customary practices. The second line means transforming customary use rights into more limited co-operative or corporate groups:. Boards take over Elders' decision-making and the option of upheld productivity can be combined with market involvement. Yet:

Policy needs for pastoral production involve designing enterprises for livestock production that are both suitable for the changed circumstances and draw on existing competence.

Build support systems

Drylands are more often than not located in politically disputed areas. Inhabitants are only marginally involved in national development processes. The circumstances have caused a common perception of drylands as filled with poverty. This is a simplistic picture as poverty is connected with both an expansion of activities like tourism, energy production or mining into drylands and of collapse by local redistribution systems of livestock (rather than land). The conditions for upheld adaptive livestock production need to be maintained both as a minority right and as poverty combat.

The search for resilience of community based production systems needs to be supported through regional, international or national insurance policy that can host compensation funds for climatic variability. At present extra livestock are commonly kept as buffers against evil times. There is a need for food stores or even cash bank accounts to place the surplus in during good years.

In a monetary world the logical dryland production insurance is with banking or insurance companies. These must be designed so that both local inhabitants and policy makers can feel trust and see long-term resilience in them. Even if the community perspective may be oriented towards livestock as capital, land has to provide the safety for the insurance companies: Land use needs to be properly established. Land as commodity, not merely usufruct rights of it, can provide security for insurance or loan agreements.

Resolve stakeholder interests

There is a general assumption of drylands as poverty pockets due to low production capacity. However, in reality there is no automatic link between poverty and drylands.

Many modified land use practices have been tried, also with positive results. A host of experience from livestock production exists, so that bottlenecks for sustainable development can be specified. The orientation is towards poverty eradication, normally with a production focus. A prime issue is proper management, again signaling the need for good governance.

Sorting out the various stakeholder interests is a major field for long-term resilience when combating desertification. Once these the needs of community social groups along with those of regional and other stakeholders. have been identified, the conflicting areas can be specified and addressed either through modified land use practices or through political processes towards conflict resolutions. New conditions for community-based systems have to be laid down. The forms may vary, for instance between the African and Latin American continents, but in all areas the long term principles need to be established, so that stakeholders know what options are available.

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